

## **REMARKS**

### **I. Status of Claims**

Claims 1, 5, 14-17, and 19-41 are currently pending in this Application. Claims 2-4, 6-13, 18, and 42-64 have been withdrawn. Claims 1, 5, 14-17, and 19-41 stand rejected. Claim 1 has been amended herein. Claim 1 is the only independent claim.

### **II. Interview Acknowledgement and Summary**

Applicants would like to thank the Examiner and her supervisor, Mr. Sergent, for meeting with Polly Owen, Brendan Boyd (telephonic), John Allen, and Kameron Kelly on November 6, 2007 to discuss the present Application. A summary of the meeting is provided in the Interview Summary sheet prepared by the Examiner on the day of the interview.

### **III. Election/Restrictions**

In the Office Action mailed March 22, 2006, the Examiner restricted the claims into the following six Groups:

- Group I: Claims 1-46 (Cellulose Ester)
- Group II: Claims 47-54 and 59-60 (Coating Composition)
- Group III: Claims 55-56 (Pigment Dispersion)
- Group IV: Claim 57-58 (Radiation Curable Coating)
- Group V: Claim 61-62 (Ink Composition)
- Group VI: Claim 63-64 (Waterborne Composition)

In addition, the Examiner indicated that the Application discloses the following five species groups:

- Group A: Claims 2-10 (C<sub>3</sub>-C<sub>4</sub> Ester)
- Group B: Claims 11-13 (Acetyl)
- Group C: Claims 18-19 (Hydroxyl)
- Group D: Claims 48 and 51 (Additive)
- Group E: Claims 63-64 (Water-Soluble Resin)

Applicant would like to point out that claim 1 is generic to all of the pending claims, because all the claims expressly or by dependency include all of the limitations

of claim 1. Therefore, once generic claim 1 has been allowed, all withdrawn claims should be rejoined and allowed.

#### **IV. Claim Rejections – 35 USC § 103**

##### ***A. Summary of Examiner's Rejection***

In the Office Action mailed May 16, 2007, the Examiner rejected claims 1, 5, 14-17, and 19-41 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,668,273 to Allen et al. (hereinafter, Allen) or Published PCT Application No. WO 01/35709 to Obie (hereinafter, Obie).

In rejecting these claims, the Examiner admits that Allen and Obie fail to anticipate Applicants' claimed inherent viscosity (IV) and molecular weight ( $M_n$  and  $M_w$ ) ranges because the IV,  $M_n$ , and  $M_w$  ranges disclosed in Allen and Obie do not overlap the claimed ranges. However, the Examiner goes on to assert that because the lower IV limit disclosed by Allen and Obie (0.20 dL/g) is close to the upper IV limit recited in the claims (0.18 dL/g), one skilled in the art would have expected the composition of Allen and Obie to have the same properties as the claimed composition. Therefore, according to the Examiner, a *prima facie* case of obviousness exists under the rationale set forth in *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ, 773 (Fed. Cir. 1985) (hereinafter, *Titanium Metals*).

In rejecting Applicants' claims, the Examiner also asserts that although the  $M_n$  and  $M_w$  ranges recited in Applicants' claims do not overlap the ranges disclosed in Allen and Obie, the claimed  $M_n$  and  $M_w$  ranges would be inherent in the disclosure of Allen and Obie because one skilled in the art would recognize that a reduction in IV indicates a reduction in molecular weight.

##### ***B. Applicants' Arguments Against Prima Facie Case of Obviousness***

###### **1. Amendment to Claim 1**

Applicants have amended claim 1 by narrowing the recited IV range. In particular, Applicants have narrowed the IV range of claim 1 from 0.05–0.18 dL/g to 0.05–0.15 dL/g. Support for this amendment can be found, for example, in the

specification at page 19, lines 25-27. As discussed in detail below, this amendment to claim 1 further widens the gap between Applicants' claimed IV values and the IV values disclosed in Allen and Obie.

Table 1, below, provides a side-by-side comparison of numerical ranges from amended claim 1 that do not overlap the disclosed values of Allen and Obie.

**Table 1**

<b>Comparison Of Claimed and Disclosed Ranges</b>			
<b>Property of the Cellulose Ester</b>	<b>Range Recited In Claim 1</b>	<b>Range Disclosed In Allen</b>	<b>Range Disclosed In Obie</b>
IV	0.05 – 0.15	0.2 – 0.70	0.2 – 1.7
M <sub>n</sub>	1,000 – 7,000	9,000 – 40,000	84,700
M <sub>w</sub>	1,500 – 23,000	30,000 – 100,000	n/a

## **2. Titanium Metals Does Not Support Obviousness Conclusion**

According to the ruling in *Titanium Metals*, a *prima facie* case of obviousness may exist where the claimed ranges and the prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. Applicants submit that the rule of *Titanium Metal* cannot be used to establish a *prima facie* case that Applicants' claims are obvious over Allen and Obie because one skilled in the art would recognize that the composition disclosed in Allen and Obie and the claimed composition have significantly different properties.

In *Titanium Metals*, the claim at issue called for an alloy comprising 0.3% molybdenum (Mo) and 0.8% nickel (Ni). The prior art cited against the claim disclosed one alloy comprising 0.25% Mo and 0.75% Ni and another alloy comprising 0.31% Mo and 0.94% Ni. Table 2, provides a side-by-side comparison of the disclosed and claimed values at issue in *Titanium Metals*.

**Table 2**

<b><i>Titanium Metals</i> - Disclosed and Claimed Values</b>			
	<b>1<sup>st</sup> Disclosed Alloy</b>	<b>Claimed Alloy</b>	<b>2<sup>nd</sup> Disclosed Alloy</b>
Molybdenum	0.25%	0.3%	0.31%
Nickel	0.75%	0.8%	0.94%

As clearly shown in Table 1, in *Titanium Metals*, the prior art disclosed values that straddled the claimed values. Further, the claimed values in *Titanium Metals* specified the amount of certain components in the composition, not actual properties of the composition.

In contrast to *Titanium Metals*, Applicants' claimed IV,  $M_n$ , and  $M_w$  are actual properties of the composition – not simply components of the composition. Further, Applicants' claimed IV,  $M_n$ , and  $M_w$  values are significantly lower than all the values disclosed in Allen and Obie – not straddled by the values disclosed in Allen and Obie.

According to the Examiner, an IV change of 0.02 dL/g (or a change of 0.07 dL/g) would not significantly change the properties of Applicants', Allen's, or Obie's cellulose ester compositions. Since Applicants have amended claim 1 to recite an upper IV limit of 0.15 dL/g, the Examiner's argument that a 0.02 dL/g change in IV would not change the properties of a cellulose ester composition is now moot because there is a 0.05 dL/g gap between the IV range of amended claim 1 and the IV range disclosed in Allen and Obie.

Applicants submit that a 0.05 dL/g difference in the IV of a cellulose ester is a significant property difference. Applicants' claim 1 now recites an IV range of 0.05 to 0.15 dL/g, while the lowest IV disclosed by Allen and Obie is 0.20 dL/g. When considering IVs in this range (i.e., 0.05–0.20 dL/g), a change of 0.5 dL/g is very significant. As summarized in Table 3, below, a 0.5 dL/g IV increase from 0.05 to 0.10 dL/g is a 100% change in IV, an increase from 0.10 to 0.15 dL/g is a 50% change in IV, and an increase from 0.15 to 0.20 dL/g is a 25% change in IV.

**Table 3**

<b>0.05 dL/g Changes In IV</b>	<b>% Change In IV</b>
0.05 → 0.10	100
0.10 → 0.15	50
0.15 → 0.20	25

Thus, in the range of IV values relevant to the instant Application (i.e., 0.05–0.20 dL/g) a 0.05 dL/g IV increase equates to a 25–100% change in IV.

Applicants submit that a 25-100% IV change is significant, and since IV is itself a key property of Applicants', Allen's, and Obie's cellulose ester compositions, a 25-100% change in IV is, on its face, a significant property change. Therefore, *Titanium Metals*, which requires the prior art composition and the claimed composition to have the same properties, cannot be used to reach a conclusion that Applicants' claims are obvious over Allen or Obie.

In addition, other properties of cellulose esters change significantly when the IV of a cellulose ester is changed by 0.05 dL/g. For example, a 0.05 dL/g change in IV can significantly change the molecular weight ( $M_n$  and/or  $M_w$ ) of a cellulose ester. The present Application provides data evidencing that a 0.05 dL/g change in IV correlates to a substantial change in the  $M_n$  and  $M_w$  of a cellulose ester. In particular, Table 2 on page 51 of the present Application provides IV,  $M_n$ , and  $M_w$  property data for three different cellulose esters (Examples 2-4). The IV,  $M_n$ , and  $M_w$  property data for the cellulose esters of Examples 2-4 is reproduced below in Table 4

**Table 4**

<b>Cellulose Esters of Examples 2-4</b>			
	Example 1	Example 2	Example 3
IV	0.11	0.11	0.103
$M_n$	4,600	4,400	1,074
$M_w$	13,100	11,000	3,174

The data presented in Table 4 demonstrates that changing the IV from 0.103 dL/g to 0.11 dL/g increases the  $M_n$  from 1,074 to at least 4,400 and increases the  $M_w$  from 3,174 to at least 11,000. On a percentage basis, the data in Table 4 indicates that a 7% increase in IV translates to at least a 300% increase  $M_n$  and at least a 245% increase in  $M_w$ . Thus, the data in Table 4 shows that an IV change as small as 0.007 dL/g has a very significant impact on the  $M_n$  and  $M_w$  properties of a cellulose ester. Therefore, based on this data, a 0.05 dL/g change in IV of a cellulose ester would also be expected to significantly change the  $M_n$  and  $M_w$  of the cellulose ester. Accordingly, *Titanium*

*Metals*, which requires the prior art composition and the claimed composition to have the same properties, cannot be used to reach a conclusion that Applicants' claims are obvious over Allen and Obie.

In view of the foregoing, Applicants submit that the Examiner has failed to establish a *prima facie* case of obviousness with respect to claims 1, 5, 14-17, and 19-41.

### **3. No Reason To Modify Allen and Obie To Arrive At Claimed Properties**

As demonstrated above, *Titanium Metals* cannot be relied upon to establish a *prima facie* case of obviousness for claims 1, 5, 14-17, and 19-41. Therefore, since the claimed ranges of IV,  $M_w$ , and  $M_n$  do not overlap the disclosed ranges of Allen and Obie, in order to establish a *prima facie* case of obviousness, the Examiner has the burden of articulating a reason why one skilled in the art would have modified the compositions of Allen and Obie to lower the IV,  $M_w$ , and  $M_n$  into the ranges now claimed by Applicants.

Applicants submit that at the time of the present invention, one skilled in the art had no reason to modify the compositions of Allen and Obie by lowering their IV,  $M_w$ , and  $M_n$  values into Applicants' claimed ranges because, for example, Allen and Obie teach away from such a modification.

Allen teaches that an increase in viscosity is beneficial in waterborne coatings, and provides superior compatibility. (Col. 2, ll. 53-62). Further, Allen teaches that a rapid viscosity build is useful for reducing runs and sags in waterborne spray applications. (Col. 6, ll. 24-26). Finally, Allen teaches that an increase in viscosity helps prevent sagging of the coating. (Col. 16, ll. 18-21).

Obie incorporates by reference U.S. Patent No. 5,994,530 as an example of CMCAB esters for use in accordance with the claimed method. (P. 15, ll. 27-30). The '530 Patent teaches away from decreasing the inherent viscosity of these CMCAB esters. For example, the '530 Patent teaches that an exponential increase in viscosity in the CMCAB esters is beneficial for waterborne coatings and gives the CMCAB esters superior compatibility over conventional esters. (Col. 3, ll. 59-65). Further, the '530

Patent teaches that increased viscosity is also useful for reducing runs and sags in waterborne spray applications. (Col. 9, ll. 31-33).

Allen and Obie only discuss the benefits of increased viscosity, which would motivate one to increase IV,  $M_w$ , and  $M_n$  of the cellulose ester. Allen and Obie never suggest that lowering IV,  $M_w$ , or  $M_n$  would provide any benefits. Rather, when taken as a whole, the teachings of Allen and Obie would actually discourage one skilled in the art from attempting to lower the IV,  $M_w$ , and  $M_n$  of the cellulose esters described therein. Therefore, because, for example, there was no reason to modify the compositions of Allen and Obie by lowering their IV,  $M_w$ , and  $M_n$  towards Applicants' claimed values, claims 1, 5, 14-17, and 19-41 are not obvious over Allen and Obie.

#### **4. Other Properties Not Inherent By Simply Lowering The IV**

In the Office Action, the Examiner asserts that by lowering the IV of Allen's and Obie's cellulose esters, one would inherently produce a composition having  $M_w$  and  $M_n$  values within Applicants' claimed ranges. As discussed above, prior to the present invention, no reason existed to modify the compositions of Allen and Obie by lowering their IV into Applicants' claimed range. However, even if one did lower the IV of Allen's and Obie's compositions into Applicants' claimed range, the resulting lower-IV cellulose esters would not necessarily have  $M_w$  and  $M_n$  values within Applicants' claimed ranges.

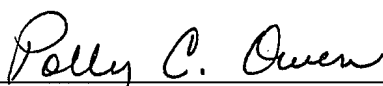
It is well established that in order to support a rejection based on inherency, the property asserted to be inherent must necessarily be present in the prior art. (MPEP § 2112). In other words, inherency cannot be established by probabilities or possibilities. (MPEP § 2112). Therefore, in order for the  $M_w$  and  $M_n$  values to be inherent in a lowered-IV composition of Allen and Obie, the Examiner must provide a rationale or evidence as to why these properties would necessarily fall within Applicants' claimed ranges. Because the Examiner has not provided a proper rationale or evidence that lowering the IV of Allen's or Obie's cellulose esters into Applicants' claimed IV range would necessarily result in a composition having  $M_w$  and  $M_n$  values within Applicants' claimed ranges, the Examiner cannot rely on inherency to establish obviousness of the  $M_w$  and  $M_n$  values.

In view of the foregoing, Applicants submit that the Examiner has failed to establish a *prima facie* case of obviousness with respect to claims 1, 5, 14-17, and 19-41.

## V. Conclusion

In light of the foregoing, Applicants submit that claims 1, 5, 14-17, and 19-41 are in condition for allowance. Further, since claim 1 is generic to all pending claims, Applicants request rejoinder of all withdrawn claims and allowance of claims 1-64.

Respectfully submitted,

  
Polly C. Owen  
Registration No. 44,991

Eastman Chemical Company  
P.O. Box 511  
Kingsport, Tennessee 37662  
Phone: (423) 229-5534  
FAX: (423) 229-1239

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